

Remarks

Claims 1-11, 14, 17, 18, 19, and 43 were previously pending in the subject application. By this Amendment, the applicants have amended claims 1 and 43, cancelled claims 14 and 17-19, and added new claims 44-47. Support for the amendments can be found throughout the application as originally filed, including pages 7-17 and claims 18-19. No new matter has been introduced. Accordingly, claims 1-11 and 43-47 are before the Examiner for further consideration. Favorable consideration of the claims now presented is earnestly solicited.

The amendments set forth herein should not be interpreted to indicate that the applicants have agreed with, or acquiesced to, the rejections set forth in the outstanding Office Action. The amendments to the claims have been made in an effort to lend greater clarity to the claimed subject matter and to expedite prosecution. Favorable consideration of the claims now presented, in view of the remarks and amendment set forth herein, is earnestly solicited.

Claims 1-4, 6-10, 14, 18, and 43 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Caselli *et al.* (E.P. 1146111) in view of Stevens (U.S. 5,712,237) and Scheuing *et al.* (U.S. Patent Application Publication No. 2003/0220223). The applicants respectfully traverse this rejection to the extent that it might be applied to the claims now presented for examination.

The current invention is directed to a composition that can, via vapor release, disinfect a space for an extended period of time. The long-term vapor disinfection effect is achieved by a combination of factors, including 1) using a mixture of volatile and non-volatile solvents, in the claimed ratio of 3:1 to 1:3; and 2) utilizing the claimed carriers, *i.e.*, amorphous silicon dioxide (claim 1) and non-woven material comprising cellulosic fibers and plastic (claim 43), which absorb the composition and enable subsequent release of the active mixture in a controlled manner.

One skilled in the art would have had no reason to combine the cited references to arrive at the current invention. Specifically, there would be no reason to arrive at a composition wherein the weight ratio of volatile to non-volatile solvents is in the range of 3:1 to 1:3 and the carrier is amorphous silicon dioxide (claim 1) or a non-woven material comprising cellulosic fibers and plastic (claim 43).

One skilled in the art would have had no reason to combine Caselli *et al.* and Stevens to produce the current composition. The Caselli *et al.* reference relates to sanitizing hard surfaces contaminated with pathogenic bacteria. The sanitization of hard surfaces is achieved by bringing the compositions into direct contact with the contaminated surface (*i.e.*, using a wipe) for a short period of time. Although the Caselli *et al.* reference broadly discloses that suitable solvents include all those known in the art for hard-surface cleaning compositions, including the list of solvents spanning paragraphs 0110-0127, it provides no indication of what solvents or solvent ratios should be included in a given solvent formulation.

The Stevens reference is directed to a dry-cleaning composition for removing contaminants from textiles. The dry-cleaning composition is a mixture of cleaning solvents, including dibasic esters, hydrophilic, hydrophobic and phenyl-substituted benzyl alcohols, and water (column 5, line 66 to column 7, line 6). The cleaning solvents solubilize fabric contaminants and evaporate rapidly at elevated drying temperatures; as the vaporized solvents detach from the fabric during the drying step, contaminants solubilized in the dry-cleaning solvents are removed (column 2, line 26 to column 4, line 34).

The use of alcohols and water in the specific weight percentages as described in Stevens is to improve physical and chemical properties of the dry-cleaning composition and to enable the rapid removal of contaminants under elevated temperatures. Specifically, the use of hydrophilic alcohols “was found advantageous for compatibilizing the dibasic esters and water as well as enhancing the distillability of the final composition.” (the Results section at column 28, lines 44-47). Also, some enhanced removal of hydrophilic components would be expected with the inclusion of alcohol (column 28, lines 45-49). The use of alcohols also promotes distillation of the dry-cleaning composition and enhances the likelihood of forming azeotropes with co-solvents (column 6, lines 21-30). With regard to water, Stevens teaches that water is added at a level preferably ranging from about 40% to about 60%-65% by weight to provide good cleaning efficiency, generally acceptable distillation temperatures, and competitive manufacturing cost (column 28, line 62 to column 29, line 1).

In other words, in Stevens, alcohols are used to help dissolve the dibasic esters in the water, as well as to lower the required distillation temperature, to remove the solvents from the cleaned garments, and to allow re-use of the fluid. Alcohols are also used to dissolve otherwise insoluble materials into water. The water is added to reduce cost and to provide a relatively low distillation temperature (column 10, line 61), given that the distillation typically occurs at 120 to 150°C (column 13, lines 7-16).

Thus, the choice of solvents and their weight ratios in Stevens depends solely on the desired characteristics of a dry-cleaning composition. The composition is intended for use under dry-cleaning conditions, in which distillation typically occurs at elevated temperatures and removal of cleaning mixtures from treated clothing occurs in around 20 minutes (column 3, line 39 to column 4, line 34 and column 13, line 57-58). The solvents and their weight ratios disclosed by Stevens are irrelevant for Caselli *et al.* or the current invention.

The Office Action states that there is specific motivation to combine Caselli *et al.* with Stevens, that is, to control the distillation, compatibility, likelihood of forming azeotropes with co-solvents, solubility with hydrophilic stains, costs, etc (Office Action at paragraphs 8, 23, and 58). The applicants respectfully disagree.

One skilled in the art would have had no reason to take the weight ratios of alcohols and water contained in a dry-cleaning composition disclosed by Stevens, to modify a completely different composition disclosed by Caselli *et al.* The Caselli *et al.* composition is for wiping hard surfaces at room temperatures. It does not involve distillation, *i.e.*, vaporizing it, then condensing it by cooling the vapor, and collecting the resulting liquid. Also, the components of the Caselli *et al.* composition are different from the Stevens composition; therefore, the weight percentages of alcohols disclosed by Stevens, which are used to compatibilize with the components of the Stevens composition, are irrelevant for the Caselli *et al.* composition. Further, as the Caselli *et al.* composition is applied at room temperatures, it is irrelevant whether azeotropes are formed, as an “azeotrope” is a mixture of two liquids that has a constant boiling point and composition throughout distillation).

With regard to paragraphs 81 and 82 of the Office Action, please note that the entire ranged of the solvent ratio as recited in the claims is critical for the long-term disinfection of a space.

Specifically, Examples 7 and 8 demonstrate the long-term efficacy (up to eight weeks in Example 8) of the composition comprising volatile and non-volatile solvents in a ratio of 1:3. Examples 1 and 9 also demonstrate the long-term efficacy of the composition comprising volatile and non-volatile solvents in a ratio of 3:1. Also, Example 11 demonstrates the long-term efficacy, over an eight week period, of a composition comprising volatile and non-volatile solvents in a ratio of 1.86:1 (closer to the middle of the claimed ratio range).

In addition, Example 4 demonstrates the efficacy of the composition of the present invention when compared with a prior art composition (Caunt *et al.*; EP0965541). The Caunt *et al.* composition does not comprise a solvent mixture in the claimed ratio. As shown in Table 4, the addition of a solvent mixture with a ratio of volatile to non-volatile solvents of 1: 2.33 (which is within the ratio range as defined in claim 1), significantly improves the antimicrobial performance of a vapor-phase disinfectant. Further, as described on page 10, lines 15-17 of the specification, when the ratio exceeds the claimed range (*i.e.* is increased to 5:1), the long-term anti-bacterial activity of the composition declines, compared with a ratio of 3:1. Therefore, there is a clear technical advantage associated with solvent ratio recited in the claims. Neither this advantage, nor the solvent ratios required to achieve the advantage, are obvious from the teachings of Caselli *et al.* and Stevens, either taken alone or in combination.

Furthermore, the Stevens reference would not have logically come to an inventor's attention in the process of producing a composition for providing long-term disinfection effects of a space. Specifically, the solvent ratio of the current invention is critical for providing vapor-phase disinfecting effects of a space over a prolonged period of time, whereas the Stevens dry-cleaning composition has nothing to do with disinfection. In addition, the current invention is for use under room temperature, whereas the Stevens dry-cleaning composition is for use under elevated temperatures or pressures. Thus, the Stevens reference is entirely irrelevant with respect to the current invention not only in terms of the intended purpose, but also in terms of the physical requirements and operable conditions of the solvent mixture. Thus, a skilled artisan would not even look to the Stevens reference for guidance in arriving at the current invention.

With regard to the carrier material recited in claim 1, please note that the Schueing *et al.* reference does not teach or suggest using amorphous silicon dioxide. Thus, the combined teachings of the references fail to teach or suggest claim 1 and its dependent claims.

In addition, one skilled in the art would not use amorphous silicon dioxide as a carrier for the Caselli *et al.* composition. Amorphous silicon dioxide is not suitable for contacting the Caselli *et al.* formulation with a hard surface. If the proposed modification renders the prior art unsatisfactory or unsuitable for its intended purpose, a *prima facie* case of obviousness cannot be made. See *In re Gordon*, 733 F.2d 900, 902 (Fed. Cir. 1984).

With regard to the carrier material recited in claim 43, it would not be obvious to substitute the generic wipe disclosed in Caselli *et al.* with a non-woven material of the current invention. In the current invention, the use of a non-woven material comprising cellulosic fibres and plastic is to absorb a large amount of the disinfecting mixture and to release the composition in a controlled manner over an extended period of time (specification at page 5, lines 23-27). In comparison, the Caselli *et al.* composition is applied in direct contact with a hard surface. The use of wipes simply provides a convenient means of wiping a hard surface. In Caselli *et al.*, there is no need to provide controlled-release of a composition over an extended period. Thus, there would be no reason to replace the apparently satisfactory wipe taught by Caselli *et al.* with a carrier of the current invention, *i.e.*, a non-woven material comprising cellulosic fibres and plastic.

Further, the Scheuing *et al.* reference would not have logically come to an inventor's attention for guidance in creating a composition that provides long-term disinfection effects of a space. The Scheuing *et al.* reference is directed to a method for forming hydroscopic polymer gels to improve cleaning performance as well as cleaning compositions containing such hydroscopic polymer gels for application to a surface (see for example, Scheuing *et al.* at paragraph 0017, Abstract, claim 1). Nowhere do Scheuing *et al.* teach or suggest a composition for disinfecting a space, and a skilled artisan would not even look to Scheuing *et al.* for guidance in arriving at the current invention.

With regard to paragraph 10 of the Office Action, please note that the Scheuing *et al.* reference does not disclose a composition for disinfecting a space via the vapor phase over an extended period. Specifically, the disinfecting agents used in Scheuing *et al.* are antimicrobial materials (commonly used chemical biocides) (paragraphs 42 and 56-59), which are non-volatile and have no vapour action capability even if mixed with solvents. Also, while the Scheuing *et al.* reference lists certain solvents of the current invention, please note solvent mixtures alone, without the addition of essential oils, do not have satisfactory effects for long-term disinfection of a space (see Example 1 of the specification). Table 1 of the specification shows that the composition containing a solvent mixture alone is not as effective after 14 days and has little activity after 20 and 35 days, compared with the composition of the current invention.

To summarize, one skilled in the art would have had no reason to combine the cited references to arrive at the current invention. Specifically, there would be no reason to arrive at the composition, wherein the weight ratio of volatile to non-volatile solvents is in the range of 3:1 to 1:3; and the carrier is amorphous silicon dioxide (claim 1) or a non-woven material comprising cellulosic fibers and plastic (claim 43).

The mere fact that the purported prior art could have been combined in some manner to yield an applicant's invention does not make the combination obvious unless "there was an apparent reason to combine the known elements in the fashion claimed" by the applicant. *KSR International Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741 (2007). Accordingly, the applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a).

Claim 5 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Caselli *et al.* (E.P. 1146111) in view of Stevens (U.S. 5,712,237) and Scheuing *et al.* (U.S. Patent Application Publication No. 2003/0220223) and further in view of Julemont *et al.* (U.S. 6,380,125). The applicants respectfully traverse this rejection to the extent that it might be applied to the claims now presented for examination.

The shortcomings of the Caselli *et al.*, Stevens and Scheuing *et al.* references in combination have been discussed above. The Julemont *et al.* reference does not cure, or even address, the

aforementioned shortcomings. Accordingly, the applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a).

Claim 11 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Caselli *et al.* (E.P. 1146111) in view of Stevens (U.S. 5,712,237) and Scheuing *et al.* (U.S. Patent Application Publication No. 2003/0220223) and further in view of McCue *et al.* (U.S. 5,403,587). The applicants respectfully traverse this rejection to the extent that it might be applied to the claims now presented for examination.

The shortcomings of the Caselli *et al.*, Stevens and Scheuing *et al.* references in combination have been discussed above. The McCue *et al.* reference does not cure, or even address, the aforementioned shortcomings. Accordingly, the applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. §103(a).

Claim 17 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Caselli *et al.* (E.P. 1146111) in view of Stevens (U.S. 5,712,237) and Scheuing *et al.* (U.S. Patent Application Publication No. 2003/0220223) and further in view of Caunt *et al.* (E.P. 0965541). In addition, claim 19 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Caselli *et al.* (E.P. 1146111) in view of Stevens (U.S. 5,712,237) and Scheuing *et al.* (U.S. Patent Application Publication No. 2003/0220223) and further in view of Hartman *et al.* (U.S. Patent Application Publication No. 2005/0106121).


By this Amendment, claims 17 and 19 are cancelled, thereby rendering moot these rejections.

In view of the foregoing remarks and amendment, the applicants believe that the currently pending claims are in condition for allowance, and such action is respectfully requested.

The Commissioner is hereby authorized to charge any fees under 37 CFR §§1.16 or 1.17 as required by this paper to Deposit Account No. 19-0065.

The applicant also invites the Examiner to call the undersigned if clarification is needed on any of this response, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,

A handwritten signature in black ink, reading "David Saliwanchik". The signature is fluid and cursive, with the first name "David" and last name "Saliwanchik" clearly distinguishable.

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